REMARKS

Please reconsider the application in view of the above amendments and the following remarks.

I. Objection to the Specification

In the Office Action of August 14, 2002, the Examiner objected to the specification because the specification contained numbers in brackets at the beginning of every paragraph. In response, Applicant submitted a substitute specification in which the bracketed paragraph numbers had been removed (included herein as part of Appendix B). In the present Office Action, the Examiner notes that no marked-up copy of the original specification showing amendments thereto was included with the previous submission. Thus, a marked-up copy of the original specification is enclosed with this response in Appendix C. Accordingly, Applicant respectfully requests withdrawal of the objection to the specification.

II. Disposition of the Claims

Claims 1-22 are pending in the instant application. Claims 1, 6, 11, and 17 are independent. Claims 2-5, 7-10, 12-16, and 18-22 depend, directly or indirectly, from the independent claims.

III. Claim Amendments

Independent claims 1, 6, 11, and 17 have been amended to recitc that the first and second bumps are adjacent to each other. No new matter has been added by way of these amendments. Support for thcse amendments may be found, for example, in Figures 8a, 8b, and 8c of the instant application.

IV. Rejections Under 35 U.S.C. § 102

Claims 1-22 stand rejectcd under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,323,559 (the '559 patent) issued to Chan et al. To the extent that this rejection still applies to the claims as amended, the rejection is respectfully traversed.

Amended independent claims 1, 6, 11, and 17 of the instant application require *adjacent* first and second bumps positioned on a first metal bar and a reference bump positioned on a second metal bar such that an angle between a line from the reference bump to the first

bump and a line from the reference bump to the second bump adjacent to the first bump is substantially equal to 150 degrees. Such an arrangement is exemplified in the embodiments shown in Figures 8a, 8b, and 8c of the instant application.

Figure 10 and related portions of the '559 patent were cited as anticipating independent claims 1, 6, 11, and 17 and the remaining claims of the instant application. Figure 10 shows an arrangement in which alternating ground (VSS2) (280) and power (VDD2) (282) bumps are positioned. The '559 patent is directed toward a bump arrangement in which bumps are hexagonally arranged. '559 patent, col. 3, lines 64-66. In Figure 10 of the '559 patent, bump groups are shaped as parallelograms. '559 patent, col. 7, lines 22-25.

Amended claims 1, 6, 11, and 17 require that a line from a reference bump to a first bump and a line from the reference bump to a second bump *adjacent to the first bump* be substantially equal to 150 degrees. As the Examiner notes in the present office action, "the claim does not limit the 'line' to be 'taken' along bumps with no other bumps in between those bumps and the reference bump." Thus, arbitrary bumps may be chosen such that the 150 degree limitation is met by the '559 patent (see especially figure 10). However, the amended independent claims of the present application require that the first and second bumps be adjacent to one another. No group of three bumps in lines 280 and 282 of the '559 patent satisfies the adjacency limitations of amended claims 1, 6, 11, and 17. In particular, in Figure 10 of the '559 patent, the angle formed between a line from a reference bump on a first metal bar to a first bump on a second metal bar and a line from the reference bump to a second bump *adjacent to the first bump* on the second metal bar is approximately 60 degrees and not substantially equal to 150 degrees as required by the amended independent claims of the instant application.

Assuming *arguendo* that one could modify the metal bars in Figure 10 of the '559 patent to be oriented vertically (as opposed to horizontally oriented metal bars 280 and 282 shown in figure 10 of the '559 patent), the '559 patent still does not disclose or suggest the present invention as recited in the claims. As described in the present application, a realization of a close-to 150 degree angle requires modification to the spacing between the bumps via modification to the spacing between metal bars. For example, as shown in Figures 8a and 8b of the instant application, the metal bars 52 and 54 are positionally brought in closer and physically modified in order to achieve the 150 degree angle required in amended claims 1, 6, 11, and 17.

The '559 patent fails to show or suggest how a 150 degree angle is or could be obtained. In other words, a mere grouping of bumps into parallelogram shapes in no way, mathematically or otherwise, shows or suggests how a 150 degree angle is or could be achieved.

Thus, the '559 patent fails to anticipate amended independent claims 1, 6, 11 and 17. Accordingly, withdrawal of this rejection is respectfully requested. Claims 2-5, 7-10, 12-16, and 18-22, which depend, directly or indirectly, from claims 1, 6, 11, and 17, are patentable for at least the same reasons.

V. Conclusion

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226.147001/P6841).

Respectfully submitted,

Date: 3/7/03

#45,079

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APPENDIX A – MARKED-UP VERSION OF THE AMENDED CLAIMS

1 (Twice amended) An integrated circuit having a top metal layer, the top metal layer having a first metal bar and a second metal bar, the integrated circuit comprising:

a first bump disposed on the first metal bar;

a second bump disposed on the first metal bar, wherein the second bump is adjacent to the first bump; and

a reference bump disposed on the second metal bar,

wherein the first bump and the second bump are positioned such that an angle between a line from the reference bump to the first bump and a line from the reference bump to the second bump has a value substantially equal to 150 degrees.

6 (Twice amended) An integrated circuit having a top metal layer, the top metal layer having a first metal bar and a second metal bar, the integrated circuit comprising:

a first bump disposed on the first metal bar;

a second bump disposed on the first metal bar; and

a reference bump disposed on the second metal bar, wherein the second bump is adjacent to the first bump,

wherein the first metal bar and the second metal bar are positioned such that an angle between a line from the reference bump to the first bump and a line from the reference bump to the second bump has a value substantially equal to 150 degrees.

11 (Twice amended) A patterned bump array for a power grid of an integrated circuit, comprising:

a reference bump disposed on a first metal bar;

a first bump disposed on a second metal bar; and

a second bump disposed on a second metal bar,

wherein the second bump is adjacent to the first bump, and

wherein the first bump, the second bump, and the reference bump are arranged such that an angle between a line from the reference bump to the first

bump and a line from the reference bump to the second bump has a value substantially equal to 150 degrees.

17 (Twice amended) A bump layout for a power grid of an integrated circuit, comprising:

a reference bump disposed on a first metal bar;

a first bump disposed on a second metal bar; and

a second bump disposed on a second metal bar,

wherein the second bump is adjacent to the first bump, and

wherein the first metal bar and the second metal bar are arranged such that an angle between a line from the refcrence bump to the first bump and a line from the reference bump to the second bump has a value substantially equal to 150 degrees.